EFFICIENCY, RENEWABLES & DEMAND ANALYSIS DIVISION

BLUEPRINT

Seeking Excellence

An interview With Charles Segerstrom on PG&E's Energy Training Center – Stockton – page 6

Extreme Makeover Meets Energy Efficiency

"Extreme Makeover-Home Edition" — The Real Story

Something remarkable happened on ***"Extreme Makeover-Home Edition"*** and ***"Extreme Makeover-How'd They Do That,"*** which aired on Sunday and Monday, March 27, 28, at 8:00 p.m. on the ABC television network.

The program featured a worthy large family (the Leomiti's) who were rewarded with a larger, very energy efficient home to replace their old cramped quarters.

But the remarkable hidden story, was that the new Leomiti home used building science and many current state-of-the art programs, features and techniques to deliver super energy efficiency, comfort, and environmental protection.

The use of photovoltaics, water conservation and energy conservation techniques helped deliver a special house for the family.

It was an important opportunity to increase interest in super-efficient homes with renewable energy — by highlighting the features and performance of this home — and raising the awareness of the public to the possibilities of energy efficiency.

The new home is estimated to provide over a 70 percent savings on the family's electrical bill, compared to a typical home of similar size and design. Fluorescent lighting was used in all recessed cans and exterior fixtures. Each bulb achieves approximately 66 percent energy saving over an incandescent bulb.

Hot water for the home is heated with an on-demand tankless water heater. This type of water heater saves energy by not needing to keep a tank of water hot. Energy Star® appliances were used throughout the house to reduce plug loads. The home uses high thermal mass hard surface floors, 5/8" drywall on walls and two layers of 5/8" drywall on ceilings for maximum thermal mass effect and energy savings.

The HVAC ducts were sealed and tested to a leakage of no more than six percent of the fan airflow to prevent wasted energy. The house has an engineered energy efficient HVAC System with a 90 percent AFUE furnace and 13 SEER air conditioner with a thermostatic expansion valve (TXV).

The new home was built in seven days by a crew from Pardee Homes, during what turned out to be an unusually rainy time in Southern California. While the house's efficiency and convenience were mentioned a number of times on both programs, not much detail on how those savings were achieved was provided.

Instead, the two televised episodes concentrated on the human drama, the glamour of the interior and exterior design involved, and

Continued on next page

Pictured below: Pardee Homes President, Mike McGee and Vice-President of Marketing, Joyce Mason accept recognition from Energy Commissioner Jackalyne Pfannenstiel. The home is an Energy Commission "California Zero Energy New Home," a voluntary pilot program that seeks to achieve a 70 percent savings on electric bills. This house is the first house ever built to these brand new guidelines.

Continued from previous page

a visit to the home by Arnold Schwarzenegger, California's Governor.

Governor Schwarzenegger was there to recognize Pardee's commitment to energy efficiency and conservation of resources.

Including the Governor, a number of other government officials were on the scene to recognize the energy and environmental achievements of this house. The Energy Commission's Vice Chair, Jackalyne Pfannenstiel, thanked Pardee Homes for their commitment to energy efficiency and renewable energy. The home is an Energy Commission ***"California Zero Energy New Home,"*** a voluntary pilot program that seeks to achieve a 70 percent savings on electric bills. This house is the first house ever built to these brand new guidelines.

David Garman, Acting Undersecretary of Energy for the U.S. Department of Energy presented Pardee President Mike McGee and VP of Mareketing Joyce Mason with the 2005 ***"Energy Value Housing Award."*** The Leomiti's new home, is a California Energy Star home, which exceeds Title 24 Energy Efficiency Standards by 15 percent. It is also a ***Zero Energy Home*** under a US Department of Energy voluntary pilot program to utilize technologies that will save the family up to 50 percent on their overall Energy Bill.

Governor Arnold Schwarzenegger welcome's the Leomiti family to their new super energy efficient home.

Below: Pardee Homes President, Mike McGee and VP of Mareketing, Joyce Mason accept the "Energy Value Housing Award" from David Garman, Acting Undersecretary of Energy for the U.S. Department of Energy

The program was filmed February 15-22, 2005 in Los Angeles, California. Pictures shown are through the courtesy of Pardee Homes.

The Leomiti's new house is built under a number of Pardee Homes' special ***"LivingSmart"*** *designations:*

The **"EnergySmart"** component of the home both saves and produces energy. The house has a 3.0 kW photovoltaic system. This system is a new roof-integrated system by GE Energy that blends seamlessly with the roof design.

R-38 attic and R-19 wall insulation were used to provide high insulation levels to reduce heat gain during the summer and heat loss during the winter. A radiant roof barrier, was used to reflect heat away, keeping the attic space cooler and more efficient.

The house also has high performance dual pane vinyl frame windows with spectrally selective glass to increase the comfort of the house.

In the summer, spectrally selective glass lets in visible sunlight while blocking 80 percent of both the infrared and ultraviolet solar energy that drives up cooling costs and degrades curtains, window treatments, carpeting and furnishings. In the winter, these glazing products offer reduced heating costs by reflecting room-side radiant heat back into the room.

The 90 percent AFUE and 13 SEER with a thermostatic expansion valve (TXV) HVAC System was engineered to be properly sized and balanced to assure comfort and energy savings.

The "**SmartVent Cooling System"** has smart thermostat controls and works in conjunction with the home's air conditioner to bring in cool night air to keep the house cooler in warmer summer months.

The Leomiti's new house is **"WaterSmart"** and saves water by using flow restricted plumbing fixtures, including showerheads and toilets. These fixtures save water by reducing the flow from as much as three gallons per minute to one gallon per minute.

For watering parts of the yard, the home is set up with a programmable satellite controlled sprinkler system, which

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weather conditions, and drip irrigation of drought tolerant plant material. Artificial turf is used in the backyard.

Inside the house the Energy Star® washing machine uses 40 percent less water than standard models. The Energy Star dishwasher and the tankless water heater save both energy and water.

The home is also a **"California Friendly Home,"** a voluntary program to utilize technologies, both inside and outside the home, that save water. This program is sponsored by the Family of Southern California Water Agencies.

This **"EarthSmart"** house uses Weyerhaeuser wood that comes from managed forests and is engineered to use more of the tree during its manufacturing. The Carpet is made from recycled soda bottles. For every 2,000 sq. ft. of carpet, 10,000 soda bottles will be kept out of the landfill. The bamboo flooring material: a renewable resource, bamboo is actually a grass that renews itself within a short period of time.

Concrete rubble was saved from the build site and re-used as paving in landscape walkways. This prevents waste materials from going into landfill. Approximately 90 percent of construction waste will be recycled.

"HealthSmart" means the formaldehyde-free insulation reduces off-gassing that can sometimes occur. The environmentally-friendly water-based paint reduces odor and off-gassing. Fiber-free hard surfaces on downstairs living areas reduces fiber and dust particles that can float through the air. A central vacuum cleaner reduces dirt and dust in the air of the home by sending it to a canister in the garage. Filtration for indoor air quality is provided by an electronic air filter:

The home was also built to the **California Green Builder Program** requirements, a California Building Industry Association/Building Industry Institute (CBIA/BII) program.

For Additonal information and pictures go to:
http://www.pardeextreme.com/one_extreme_story/stars_and_guest_stars.php

The Energy Commission's New Title 24 web portal is at:
http://www.energy.state.ca.gov/title 24

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Q. If a residential luminaire does not have the Energy Star®/T24 05 label, can we assume that the luminaire does not meet the efficacy, electronic ballast, and outdoor luminaire control requirements of the 2005 Standards?

A. No, you cannot assume that. Participation in the Energy Star® program is voluntary by manufacturers. Some manufacturers will choose to not participate in this program, but will have luminaires that meet the Title 24 efficacy, electronic ballast, and outdoor luminaire control requirements. For these luminaires, product cutsheets or other manufacturer information may be used to identify complying products.

In general, compact fluorescent lamps that plug into four-pin lamp holders contain electronic ballasts and meet the 2005 Standards efficacy requirements. On the other hand, compact fluorescent lamps with two-pin lamp holders have magnetic ballasts and do not comply with the 2005 Standards.

It must also be noted that high efficacy luminaires are not the only option to meet the 2005 Standards lighting requirements. For example, in kitchens, up to 50 percent of the installed watts may be from incandescent sources; these incandescent sources that make up to 50 percent of the installed watts do not have to be high efficacy and, of course, will not have the Energy Star® label. Also, in rooms other than kitchens, the 2005 Standards have an option that includes incandescent luminaires when specified controls (either a manual on, occupant sensor, or dimmer depending on the room) are installed. Those incandescent luminaires will not have the Energy Star® label.

Q. If a recessed luminaire ("can" or "downlight") has the Energy Star®/Title 24 05 label, does that mean the luminaire complies with the zero clearance insulation cover and airtight labeling requirements of 2005 Title 24?

A. No, the Energy Star®/Title 24 05 label only indicates compliance with the high efficacy and electronic ballast requirements. It does not indicate that the luminaire meets the zero clearance insulation cover, or the airtight certification requirements. A separate label is needed to show that a luminaire is certified airtight in accordance with ASTM E283, and a separate UL or equivalent label is needed to show that a luminaire meets the zero clearance insulation cover requirements. The following examples clarify how labels are used on recessed luminaires:

- An Energy Star®/Title 24 05 label indicates the luminaire is high efficacy and has an electronic ballast.
- If there is no Energy Star®/Title 24 05 label, but the fixture has a four-pin compact fluorescent lamp holder, instead of a screw-based socket, the luminaire is high efficacy and has an electronic ballast.
- An ASTM E283 label indicates the luminaire is certified airtight. If there is a label indicating airtight or other airtight designation, but the label does not indicate ASTM E283, additional documentation is needed to show that the luminaire is certified to meet ASTM E283.
- A UL zero clearance insulation cover (IC) label, or label from another testing/rating laboratory recognized by the International Conference of Building Officials, indicates the luminaire meets the zero clearance insulation cover requirements.

CABEC President Julieann Summerford at the Energy Commission, April 21, 2005

Congratulations to CABEC for establishing strong working relationships with HERS raters as their priority goal for 2005.

CABEC's

2005 Priority: Working together With HERS Raters

"We decided that enhancing relations between CABEC members and HERS raters was critical, with the new codes coming onboard this year," said Julieann Summerford, President of the California Association of Building Energy Consultants (CABEC). "There will be so many opportunities for HERS raters and CABEC members to work together this year. So, we decided it was our job to facilitate these meetings and figure out a way to expand the interaction between HERS raters and our members."

Interactive meetings were held in late April in both Northern and Southern California to foster interaction between HERS raters, other Title 24 consultants, area architects, the Energy Commission and CABEC members.

"These meetings are the first step," according to Summerford. "This idea resulted from a report presented at a CABEC Board meeting by Tom Hamilton from CHEERS. The report dealt with some of the things that Title 24 consultants need in order to establish close working relationships with HERS raters."

According to Summerford, one of the biggest ideas to come out of these meetings is identifying ways to build individual relationships between CABEC members and active HERS raters in their local area. These one-on-one relationships will clarify roles and responsibilities for serving their clients and help them to effectively work together.

"We need to be united," Summerford added. "With the 2005 Standards approaching, these relationships will be key in transitioning through the coming Standards changes and helping to facilitate a cohesive effort in the eyes of our builder/architect clients."

Online Energy Training Videos

Over 100 videos on a variety of energy topics are available both at:

http://www.energyvideos.com or
http://www.ConsumerEnergyCenter.org/videos/

Seeking Excellence

The sixth in a series of articles about building department employees, builders, energy consultants, HERS raters, utilities and others who are making exemplary efforts to achieve energy efficiency in buildings.

Charles Segerstrom

talks to us about

PG&E's Energy Training Center (ETC) – Stockton

Charles Segerstrom

is a true pioneer in weatherization, energy efficiency and diagnostic testing in California. He supervises energy efficiency training for Pacific Gas and Electric Company, (PG&E). Charles has managed the Energy Training Center in Stockton since 1988.

His organization is responsible for developing and delivering training and technical support for PG&E's Customer Energy Efficiency programs. In 2004, the Energy Training Center conducted 448 training sessions for 7,855 contractors, builders, regulators, energy consultants and other market actors.

His tenure as Supervisor of the Center was preceded by seven years as a Trainer and Training Specialist, directly responsible for classroom instruction and oversight of the testing and certification of Residential Conservation Service (RCS) Energy Auditors to meet State and Federal guidelines.

In addition to supervising the Center, Charles has been involved in the development of the Home Energy Rating System (HERS) industry. He is the current Chairman of the Technical Committee and Vice President of the Board of Directors for the California Home Energy Efficiency Rating System (CHEERS).

In the mid-1990s Charles was appointed to the national HERS Council Technical Committee that wrote the national guidelines for HERS program certification and accreditation. He was the author of the Training and Certification and Field Inspection guidelines for the HERS Council. He served on two Residential Energy Services Network (RESNET) technical committees, and is now on the Board of Directors of Affordable Comfort, Inc.

Blueprint: ***Having a major training center devoted to building science and energy efficiency here in Northern California is no accident. Can you tell us how the Energy Training Center (ETC) started and how you became involved in it?***

Segerstrom: The Energy Training Center started in 1978, as a unique partnership between PG&E and the State of California's low-income weatherization programs. It has evolved over the years to support all residential energy efficiency programs; including a big expansion in 1981 to work with the federally mandated Residential Conservation Service Program.

PG&E created a field staff of 300 to do onsite home energy audits. The Energy Training Center was responsible for training them. That is when I started with the organization as a training specialist. I spent many years in the classroom before assuming the role of supervisor in 1988. In the past 17 years I've been supervising our activities. As our programs evolved, the State's weatherization program began to use blower door testing, which was pioneered in the Northeast in pilot programs in the late 1980s.

We've been helping the State in a training partnership to implement blower door-based weatherization since 1991. We also developed the combustion appliance safety protocols to go along with that. We've essentially touched all aspects of residential energy efficiency, with a strong emphasis on incorporating home performance and building science.

Blueprint: ***For readers who may be unfamiliar with your programs, can you tell us what you do here at the Energy Training Center?***

Segerstrom: We're unique because we're an energy center devoted to energy efficiency programs and implementation. The emphasis on diagnostic testing and verification is strong here; our goal is to spread the word to market actors who can make building performance work.

Blueprint: ***Do you charge people who attend training here?***

Segerstrom: No, we advertise as providing free continuing education for building professionals. We're funded by the public goods charge that is used for energy efficiency, renewables and low income programs; so we want to get as much participation as possible. Our programs have enough value to justify taking time away from work, which in itself is a significant cost.

Blueprint: ***What kind of people take classes here?***

Segerstrom: The professions we are targeting are HVAC contractors, residential builders, energy consultants, inspectors, building department staff, architects and general contractors.

Blueprint: ***Can you tell us a little bit about your instructors and their backgrounds?***

Segerstrom: We have in-house instructors who have "lived" this industry. Gary Fagilde has been here over 20 years, and Bill Holloway almost that long. We also do more classes with expert consultants than our own staff. We recruit nationally and internationally to locate the best experts we can find and bring them here for training. We audition many of them at

national conferences.

Blueprint: ***How many classes per year do you run here?***
Segerstrom: We support several different programs. Our contractor and builder training program conducts about 120 sessions per year. But overall, we do approximately triple that amount with all of the programs including low-income program training, commercial seminars, and support for codes and standards.

Blueprint: ***How have the classes you offer changed over the years?***
Segerstrom: We started out doing weatherization training for the State's programs and its employees. We evolved to training our own employees in the Residential Conservation Service. When those programs expired, we turned to the external market and did a lot more work with contractors and builders, as well as training for individuals involved in Title 24 issues. Then we got into training for building inspectors, plan checkers, home energy raters and building consultants.

Blueprint: ***What programs are you planning for the implementation of the 2005 Energy Efficiency Standards?***
Segerstrom: In addition to an on-going suite of Title 24 classes, we are working on a substantial effort to offer 12 different topics in support of both residential and nonresidential 2005 standards changes — everything from a standards overview for building departments to very specific technical training on duct testing rules for HVAC change-outs.

Blueprint: ***Will all of those classes be held here in Stockton?***
Segerstrom: Most will be road show sessions. We want to make it as easy as possible for other groups or government officials to participate.

Blueprint: ***So, if a group asked you for training, you could provide them with training at their location and convenience?***
Segerstrom: Yes, we just need to have a good-sized group of key upstream market participants, and we'll take the training to them.

Blueprint: ***A lot of your early work involved fixing energy leaks and waste in existing buildings, including work with low-income households. What does that weatherization work tell you about what we should be doing now in new buildings?***
Segerstrom: Weatherization evolved from prescriptive approaches such as caulking and weather stripping to diagnostic-based approaches like using blower doors and even infrared thermography. In new buildings, we should be taking advantage of the diagnostic testing and verification systems that are in place and well established, to not just to see that a home performs on paper, but that it also performs well in reality.

We're finding that while we assume insulation performs well in some cases, it's just performing as an air filter, because the insullation hasn't been installed in contact with the air barrier. Small voids in wall insulation can render the R-value to be much less than what is expected. So weatherization work has evolved into looking much more carefully at installation quality, as well as utilizing diagnostic test tools that can objectively determine performance.

Blueprint: ***When you gave us the tour of your facility today, you talked a lot about the house as a system. Could you please tell us a little more about some of the interactions you see?***

Segerstrom: The whole house perspective incorporates the interactive effects of moisture movement, air movement and heat movement. The impacts on the performance of a house are greater than just energy and cost savings.

Blueprint: ***Can you tell us about the relationship between building departments, PG&E and the Energy Training Center?***

Segerstrom: We have done substantial work in needs assessment to study the possible education and training interventions that might assist building departments. We have compiled that study utilizing Doug Beaman and Associates, and from that a training implementation plan has been developed.

The relationship with building departments has grown out of that process. Doug Beaman not only has had the experience of doing quite a few of these classes for us during the energy crisis, but has contacts at the building departments and has helped us work with their various regional chapters to implement the classes.

Blueprint: ***What about the Energy Training Center's relationship with HVAC contractors?***

Segerstrom: We've had a number of various HVAC training programs involving contractors.

Currently we work with the Contractors State License Board to get a comprehensive list of all C20 contractors. We send out a hard copy of our continuing education course calendar to all of them twice a year. Our website also provides details on our classes.

Blueprint: ***Why is PG&E interested in covering the whole performance issue with training for building departments and others?***

Segerstrom: Well, building science dictates that we become more aware of the systems issues in the performance of a building . It's not just the equipment in isolation — it is how it is installed and performs in reality — that will either optimize energy efficiency and comfort or cause problems.

So our interest in whole performance involves verification of actual performance and optimization of energy efficiency potential. Because not looking at the whole system is leaving out a great amount of opportunity.

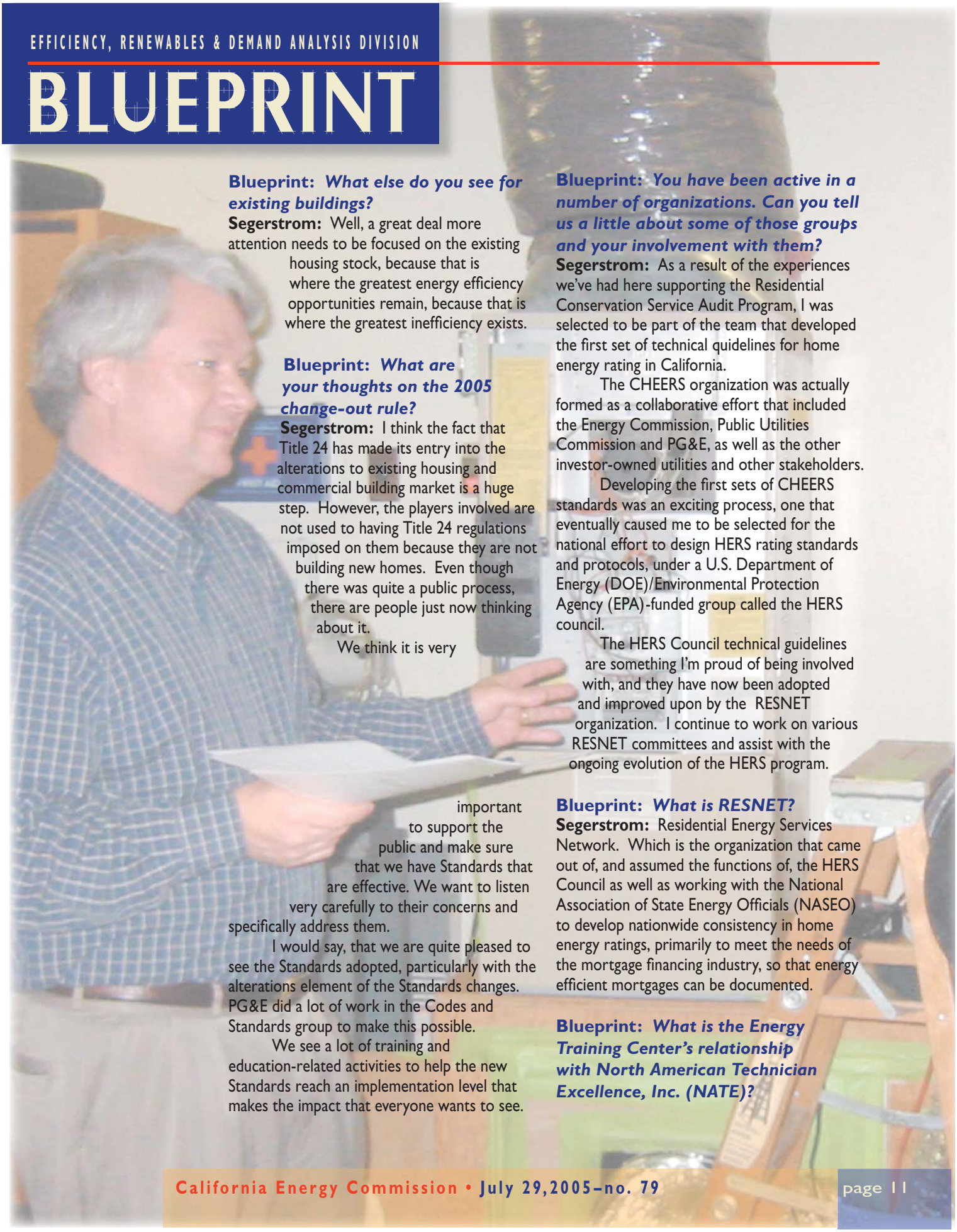
In HVAC for instance, improperly installed systems can be 35 percent less efficient than properly installed systems. So getting that system properly installed and working, with the building department to assist in the Title 24 implementation process, is very important. It has a big impact on the peak demand on our electricity system as well as the actual efficiency people realize in their homes, as opposed to theoretical efficiency.

Blueprint: ***Is field verification necessary?***

Segerstrom: It is definitely necessary. The Yankees would win every year on paper — but they play on grass. The real world of actual, measured home performance is the playing field in the case of field verification.

Having the Standards on paper is important, but having them enforced and complied with in reality is what we really need to work on, particularly in this new arena of existing housing and buildings.

We have a lot of work to do, because alterations to existing housing and commercial structures are not part of a marketplace that is used to Title 24 requirements. Field verification from a systems thinking approach is absolutely necessary given the capabilities we have with diagnostic equipment. It's not as expensive as most individuals think.



Blueprint: *What else do you see for existing buildings?*

Segerstrom: Well, a great deal more attention needs to be focused on the existing housing stock, because that is where the greatest energy efficiency opportunities remain, because that is where the greatest inefficiency exists.

Blueprint: *What are your thoughts on the 2005 change-out rule?*

Segerstrom: I think the fact that Title 24 has made its entry into the alterations to existing housing and commercial building market is a huge step. However, the players involved are not used to having Title 24 regulations imposed on them because they are not building new homes. Even though there was quite a public process, there are people just now thinking about it.

We think it is very important to support the public and make sure that we have Standards that are effective. We want to listen very carefully to their concerns and specifically address them.

I would say, that we are quite pleased to see the Standards adopted, particularly with the alterations element of the Standards changes. PG&E did a lot of work in the Codes and Standards group to make this possible.

We see a lot of training and education-related activities to help the new Standards reach an implementation level that makes the impact that everyone wants to see.

Blueprint: *You have been active in a number of organizations. Can you tell us a little about some of those groups and your involvement with them?*

Segerstrom: As a result of the experiences we've had here supporting the Residential Conservation Service Audit Program, I was selected to be part of the team that developed the first set of technical quidelines for home energy rating in California.

The CHEERS organization was actually formed as a collaborative effort that included the Energy Commission, Public Utilities Commission and PG&E, as well as the other investor-owned utilities and other stakeholders.

Developing the first sets of CHEERS standards was an exciting process, one that eventually caused me to be selected for the national effort to design HERS rating standards and protocols, under a U.S. Department of Energy (DOE)/Environmental Protection Agency (EPA)-funded group called the HERS council.

The HERS Council technical guidelines are something I'm proud of being involved with, and they have now been adopted and improved upon by the RESNET organization. I continue to work on various RESNET committees and assist with the ongoing evolution of the HERS program.

Blueprint: *What is RESNET?*

Segerstrom: Residential Energy Services Network. Which is the organization that came out of, and assumed the functions of, the HERS Council as well as working with the National Association of State Energy Officials (NASEO) to develop nationwide consistency in home energy ratings, primarily to meet the needs of the mortgage financing industry, so that energy efficient mortgages can be documented.

Blueprint: *What is the Energy Training Center's relationship with North American Technician Excellence, Inc. (NATE)?*

Segerstrom: We see NATE as an important certification entity to differentiate HVAC contractors who are willing to learn how to do installation right, and to have the willingness to take certification tests to prove themselves.

So with the knowledge that NATE is actually moving towards an advanced efficiency module, and that NATE has become the standard of excellence for HVAC installation quality, we provide training sessions to help HVAC technicians and installers prepare for their certification exam.

We established a collaborative effort with community colleges to help contractors prepare for the exams. The colleges assist by providing self-testing locations. This month, we unveiled an incentive program to cover testing costs for successful candidates. We hope to dramatically increase the number of HVAC contractors being certified.

I'm also on the Board of Directors of Affordable Comfort, which is a national organization devoted to conducting training and conferences in support of home performance and building science.

We were able to work with Affordable Comfort in bringing the conference to Northern California this past January, which I think was very beneficial to the everyone.

Blueprint: ***What do you think of the million solar homes proposal?***

Segerstrom: I'm happy to see our governor want to emphasize solar energy. I'm a solar energy and green building advocate, but there is nothing greener or more beneficial to society than getting energy efficiency right first.

My caveat with solar is that it's not the first thing you should do. There are some things you should do that have a higher priority. We've even proposed through the HERS process that before the consumer gets their solar energy rebate, they do cost-effective energy efficiency first. Then the solar power system can be smaller and the overall cost-effectiveness is better.

I'd like to make sure we don't just leapfrog to the "sexy" technology and leave relatively bland, but potentially more cost effective energy conservation measures behind.

I like to see the State of California wanting to lead the nation. I feel we are doing our best to do our part.

Blueprint: ***What have you seen that drives you to do the work you do?***

Segerstrom: Personally, this is much more than a nine-to-five job; it's more like a cause. I feel privileged to be able to do this work, because I think its important to the future of our society and for the next generation, including children of my own.

I think what I'm trying to do is further the message that looking at the house-as-a-system, and paying attention to building performance, is critically important. It's not just efficiency in terms of energy bill savings – it's comfort, health, safety and quality of life.

There is a lot left to be accomplished, because the building industry tends to be a collection of specialists. Just like the medical profession, there are many specialists who can surgically work on a piece of the human body, but too few pay attention to the whole patient.

With regards to the housing industry, we need to have more general practitioners, who can see the house-as-a-system and can perform building performance improvements.

Blueprint: ***What do you still hope to accomplish?***

Segerstrom: I just hope to continue doing what we're doing.

This article is important for what we're trying to achieve with education and training programs and I really appreciate efforts made by the Energy Commission and our education and training partnership.

PG&E's Energy Training Center – Stockton

The Energy Training Center emphasizes the "house-as-a-system" and building performance approach to home improvement. Courses are offered to outside contractors on equipment sizing and selection, ducts, insulation, and Home Energy Ratings. Classes promote the application of whole house concepts, as well as technology transfer (regarding the use of diagnostic testing equipment in residential applications) to other companies.

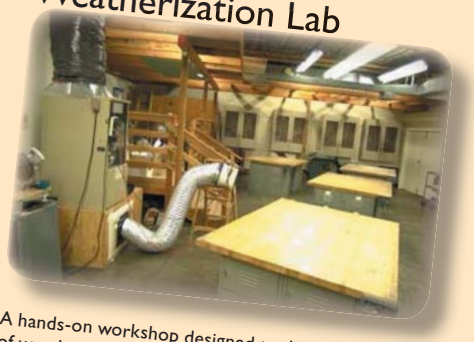
The Energy Training Center also offers a full range of classes on the weatherization assistance program, including auditing and inspection, equipment selection, duct system installation and treatment.

The Energy Training Center also offers to outside contractors courses that will prepare them for obtaining various industry certificates, such as North American Technician Excellence (NATE) and Air Conditioning Contractors of America (ACCA). The thousands of individuals trained and certified to perform residential energy efficiency programs by the Energy Training Center have made over two million service visits in Northern California homes.

Multipurpose Classroom

A versatile "great room" that can be used for large seminars, or quickly transformed into two separate classrooms. This space can accommodate up to 70 people.

Weatherization Lab



A hands-on workshop designed to develop the skills of weatherization workers. Skills required for the installation of building shell measures, such as glazing materials, caulking and weatherstripping are practiced. The lab is also used for duct testing and sealing exercises

Detached Display Home

- 1,500 square-foot, full-size house for hands-on training.
- Independent heat pump and split systems with fully accessible and modifiable duct work.
- Fully insulated, using a variety of installation techniques and materials.
- 3,000 square feet of easily accessible attic area and floor space for training purposes.

To receive detailed information about the course schedule, fees, and seating availability, contact:

PG&E's Energy Training Center – Stockton
1129 Enterprise Street
Stockton, CA 95204
(209) 465-6115

e-mail: CFS1@pge.com
Information can also be accessed through the PG&E website at: http://www.pge.com

Special Guest Editorial

Vampire Slaying and Other New Directions for Efficiency Standards

by Alan Meier

This editorial from Home Energy Magazine's March/April issue is reprinted courtesy of the magazine.

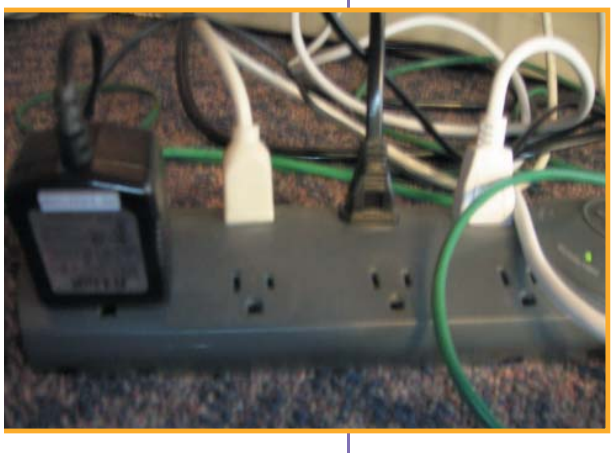
Alan Meier is the Senior Executive Editor of Home Energy Magazine.

www.homeenergy.org

Vampires: *They have two teeth and suck electricity when the appliance is switched off.*

Last December, the state of California approved new minimum efficiency standards for a host of electrical appliances from pool pumps to fans. The regulations target standby power consumption of consumer electronics, such as televisions, video players, and compact stereos. They also establish minimum efficiency standards for the ubiquitous external power supplies—President Bush calls them "vampires"—that power billions of small electrical products, such as electric toothbrushes, cordless phones, and portable hand-held vacuum cleaners.

These new standards implicitly recognize the changing landscape of residential electricity use. They also point to the new directions that efficiency standards will take in the twenty-first century. Consumer electronics are taking up an increasing share of a home's electrical load. In California homes, electronic devices—including stereos, televisions, computers, and telephone equipment—together consume more than 10 percent of a home's electrical usage just when they are off or in another low-power mode.



When on, the larger electronic devices—such as televisions, set-top boxes, and high-end home stereos—can draw sizable amounts of electricity. Televisions alone can use several hundred kWh annually; household energy use for televisions and set-top boxes combined can add up to 1,000 kWh per year.

Most of the smaller devices that the regulations target draw only a little power and consume relatively little electricity over the year. But a typical home can easily have 20 of the smaller devices scattered throughout the house, performing a myriad of visible and invisible functions.

It's easy to criticize this new set of regulations—as some publications have hastily done—as adding unnecessary costs to devices that don't consume much electricity only to achieve energy savings that are even tinier. However, these mandatory improvements are cost effective. In fact, some manufacturers may be able to cut the demand of these power sources by as much as 75 percent with no additional costs.

Although California has a reputation for striving to be on just about any cutting edge, there are a couple of very good reasons for the state to take the lead on this issue. First, California still faces an electricity crisis,

Continued from previous page

Vampire Slaying and Other New Directions for Efficiency Standards

and conservation is an essential part of the state's strategy to keep rolling blackouts at bay. Second, Californians appear to have an unusually robust appetite for these types of consumer electronics.

The collections of miscellaneous appliances in California homes are responsible for a larger fraction of electricity use there than in almost any other part of the world.

In keeping with their cutting-edge status, California's new minimum efficiency requirements for external power supplies are avant-garde for yet another reason: they are the first horizontal standard. The new regulations set a minimum efficiency for external power supplies that are connected to a whole range of devices, including portable vacuum cleaners, electric toothbrushes, cell phones, answering machines, battery chargers, and hundreds of other devices. The standard consists of two parts: a maximum allowable no-load draw and a minimum efficiency of conversion.

Thus, the standard saves power when the appliance is both off and on. Regulating the efficiency of the power supply makes both technical and administrative sense because this tactic avoids the necessity of establishing separate efficiency requirements for each device. Expect to see more horizontal standards on the horizon, especially when dealing with electronic aspects of appliances.

In another new twist, the California standards cover one device that today is barely used in America, the simple digital video converter. But it is expected to appear quickly. When all television stations in the United States convert from analog to digital broadcasting—some stations have already made that switch—existing televisions will no longer make sense of any broadcast signal.

Consumers will have to buy either a new television or a converter box. When on, each converter box draws anywhere from 8W–15W and draws only a tiny bit less when off. For a three-TV household, the converter boxes' energy use could add up to that of a new refrigerator. Converters or decoders are already widely used in Britain. There, the efficiency has actually declined over time as manufacturers sought to lower costs through a race to the bottom in efficiency.

The California standards anticipate the flood of decoders that will be arriving shortly, and they protect the consumers who purchase these devices from unknowingly creating a new electric heater next to each of their televisions.

Most global consumer electronics firms—Sony, Samsung, Panasonic, LG, for example—have a policy of designing to meet the most stringent global standards. California's new regulations are good news for the rest of the world, because they too will receive California compliant equipment.

EFFICIENCY, RENEWABLES & DEMAND ANALYSIS DIVISION

BLUEPRINT

Title 24
Energy Efficiency Standards Training

Links for training on issues relating to California Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6) is available on the Energy Commission's website at:

http://www.energy.ca.gov/title24/training

For training offered by the utilities and other organizations please see the following websites:

PG&E:
http://www.pge.com/stockton

SoCal Gas Co.
http://seminars.socalgas.com/int/default.asp

San Diego Gas and Electric
http://seminars.sdge.com/int/default.asp

SCE:
http://www.sce.com/RebatesandSavings/EnergyCenters/workshops.htm

SMUD:
http://www.smud.org/education/index.html

CALBO TRAINING INSTITUTE
http://www.calbo.org

BUILDING INDUSTRY INSTITUTE (BII)
http://www.consol.ws/bect.asp

CABEC:
http://www.cabec.org/cepetrainandtest.php

Nonresidential Fenestration Certification Initiative (NFCI)
http://nfci.ecst.csuchico.edu

Residential Lighting Design Guide
– Best practices and lighting designs to help builders comply with California's 2005 Title 24 energy code
http://www.cltc.ucdavis.edu/

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